The Birth of the Radio Networks

By Marc F. Ellis

Those of us who are old enough remember the days of radio "chain broadcasting" can still raise a goosebump or two at the thought of the network announcer, his smooth voice heavy with importance, intoning such phrases as "This is the National Broadcasting Company Blue Network" ... or maybe "This is the Columbia Broadcasting System" .... "presenting coast to coast" ... "from Hollywood" ... or "from Washington DC" .... or "from New York City's Times Square. . ." As the announcer's voice begins to rise with excitement, an uptempo musical background slyly creeps in behind it, then triumphantly swells to full volume for a few final bars after the name of the show to come is disclosed.

The development of the radio networks was a complex and fascinating process, intertwined with the history of radio broadcasting itself, and driven by corporate competitiveness, government regulation and individual players using vision, technical skill, political cunning and showmanship.

The Cross-Licensing Agreements

Probably the best place to begin the story of the networks is with the famous post-world-War-I radio "cross-licensing" agreements.

Then, as now, the technology of radio communication was complex enough that the manufacture of state-of-the-art gear required the use of ideas – and patents – developed by many different people. Wartime needs had stimulated significant technological breakthroughs in the radio art. But only because the government had agreed to indemnify radio manufacturers against suits for patent infringement. With the end of hostilities, that support was withdrawn and manufacturers' hands were tied.

As just one example, there was no way for anyone to legally manufacture the all-important triode (three-element) vacuum tube. General Electric and RCA owned the rights to the diode or "Fleming Valve" function of the tube, while AT&T controlled important rights to the "grid," or third element, invented by deForest. That impasse came to an end in July 1920, when the companies signed the first of two agreements pooling their patents so that these vital radio components could now be manufactured legally (and under their control).

The companies also divided the radio markets between them, with AT&T gaining the use of the pooled patents for wire telephony and domestic commercial radiotelephony. G.E./RCA would concentrate on operating radio messaging services – primarily between the U.S. and overseas.

Left out of the original agreement, Westinghouse joined the patent pool the following year after some tricky behind-the-scenes maneuvering. Among the patents contributed by that firm were the valuable Armstrong regeneration and superheterodyne rights. RCA would become the marketing outlet for radios manufactured by Westinghouse and G.E.

The 1920s "Radio Craze"

But, shrewd businessmen though they were, none of the individuals who forged the cross-licensing agreements of 1920 and 1921 foresaw the explosive development that would very shortly make their assignment of marketing roles all but obsolete. That development was the public's infatuation with radio reception that began in the early 1920s and spread like wildfire. Historians often refer to it as the "radio craze of the 1920s."

Almost anyone with a few dollars and reasonable mechanical skills could put together at least a simple crystal set. Newspapers and magazines bulged with radio news and radio construction information. Factory-built radios were becoming more and more available. According to one industry source, the public spent $60,000,00 on radio parts and sets in 1922; $136,000,000 in 1923; $358,000,00 in 1924.

Radio stations were going on the air by the hundreds – often built in garages and basements from used parts covered by patents controlled by the pool, and therefore illegal to use for commercial purposes. Many of them, with sketchy or nonexistent marketing plans, closed not long after they had opened. Since radio broadcasting wasn't seen, at first, as a major money making enterprise, the companies in the patent pool weren't originally overly worried about enforcement. Nor were any concerned that they themselves might be violating the pool agreement if they set up broadcast stations.

Setting up a radio station then was done with the same motivation many had (and some still have) for setting up a web site at the beginning of the internet boom. It was done for prestige, or to get one's name before the public, or just for vanity. Not too many people had figured out a way to make money out if it. G.E., RCA and Westinghouse, the manufacturing and marketing members of the patent pool, saw at least an indirect benefit from operating radio stations; the more radio programs that were out there be heard, the greater was the potential for selling radio sets.

Serious Broadcasting Begins

Westinghouse moved very aggressively into the broadcasting arena. By the end of 1920, it had established station KDKA (Pittsburgh), well-known for its pioneering coverage of the Harding-Cox election returns of that year. During the following year, two additional broadcast outlets were established: WBZ in Springfield, Mass., and WJZ in Newark, NJ. Later, KYW was established in Chicago.

RCA opened the short-lived WDY (Roselle Park, NJ) in 1921, but soon closed it in favor of a partnership in Westinghouse's technically much better WJZ. A little later, RCA assumed control of WJZ and opened both another New York area outlet (WJY) and WRC in Washington, DC. G.E.'s first station, the well-engineered WGY, went on the air from the Company's Schenectady, NY, plant in 1922. Boasting 1500 watts, it was high-powered for the era. Later, the company opened stations in Denver (KOA) and Oakland, CA (KGO).

During this period, the stations of the radio manufacturers had no direct income. Their operations were probably funded from advertising or marketing budgets. Having no sets to sell, AT&T was not vitally interested in radio *per se*. Its biggest immediate benefit from the pool was probably to gain access to legal triode

AT&T employees entertain during one of WBAY's first broadcasts. AT&T Photo.

tubes for use in the repeating amplifiers that made its long-distance wire circuits practical.

However, the firm did take advantage of its rights under the agreement to establish a radio link that made it possible to offer telephone service to Catalina Island off the California coast. Moreover, AT&T believed that it should get involved in radio broadcasting, at least as an experiment, in case the medium had the potential to compete in some way with wire telephony.

After a false start in July 1922 with station WBAY, which had a poorly-located transmitter, AT&T went on the air a month later with station WEAF. The replacement station used an efficient transmitter already located at the Western Electric building in lower Manhattan. Network operation was in the business plan from the very beginning. The New York station was to be linked, eventually, to thirty-eight other AT&T-owned stations using the Company's long lines.

Actually, networking was far from a novel idea for the Company. In an impressive 1921 demonstration, AT&T had used long-distance telephone lines, coupled to special amplifiers and loudspeakers, to "broadcast" the burial services for the Unknown Soldier from Arlington National Cemetery in Virginia to large audiences in New York City's Madison Square Garden and San Francisco's Civic Auditorium.

AT&T Introduces the Profit Motive

Since AT&T was neither in the consumer radio receiver business nor in need of flashy initiatives to enhance its public image, the Company desired to put the new broadcasting operations on a sound financial basis. It came up with a plan that might sound quaint today, but was certainly one of the first serious ideas to be implemented for the organized sale of radio time.

AT&T would not originate or provide any radio programs of its own. Instead it would offer a service called "toll broadcasting." Just as you would make a "toll call" (as connections beyond the "free" local ones were then identified) to speak with a person in another city, you would pay AT&T a toll for the use of its facilities to broadcast a message to the audience reached by the AT&T stations. And just as with a telephone call, the content was strictly up to you.

The Company faced an uphill battle as it tried to promote the idea of selling air time. Even though WEAF had rigid rules designed to play down overt commercialism in the marketing of products and services, complaints about the immorality of "ether advertising" came from individuals, institutions and even the government. And indeed no other stations were selling time during this period. WEAF stuck to its guns in this matter, but soon had to back down from its policy of not providing programs of its own.

The plain fact was that it was difficult to sell time if there was no proven listening audience. Conversely there was simply no inducement for anyone to listen if nobody was buying time. The pump had to be primed, and WEAF hired a Program Director almost immediately after broadcasting began.

A few months later, the station was transferred from the control of the very telephone-oriented long lines department to the "By-Products Services" department , whose director had a more aggressive marketing background. At the same time a new sales team was hired. New, more comfortable studios were built better to attract performing talent. Slowly but surely, revenues improved.

However, another compromise had to be made in the wholly-owned network broadcasting idea. For one thing, the radio spectrum was already becoming so congested that it was difficult to obtain licenses for new stations in the areas where they would be needed. To get the required coverage, AT&T would now offer network affiliation to strategically-located non-owned stations with which it at least had license agreements. Apparently, the only other station actually built and owned by the Company was WCAP in Washington, DC. But by the end of 1924, WEAF was the flagship station of a coast-to-coast network comprising twenty-six stations.

The Turf Wars

With the promise of increased profits from its improved management of WEAF and continued expansion of the national "radio craze," AT&T began to play legal hardball with the radio broadcasting community, including its patent-pool associates. The Company claimed that the contractual language which had given it the sole right to offer domestic telephony for hire applied to radio broadcasting just as much as it did such operations such as the Catalina Island radio link. Therefore AT&T alone had the right to offer radio time for sale.

The Company also claimed that the same agreements gave it, and its Western Electric subsidiary, the sole right to manufacture radio transmitters for broadcast use as well as to interconnect stations by wire for network broadcasting. They began to speak of levying license fees from other stations for the use of non-W.E. transmitters and for the right to broadcast at all. The Company was actually successful in collecting some of these fees, though these actions didn't exactly help its public image.

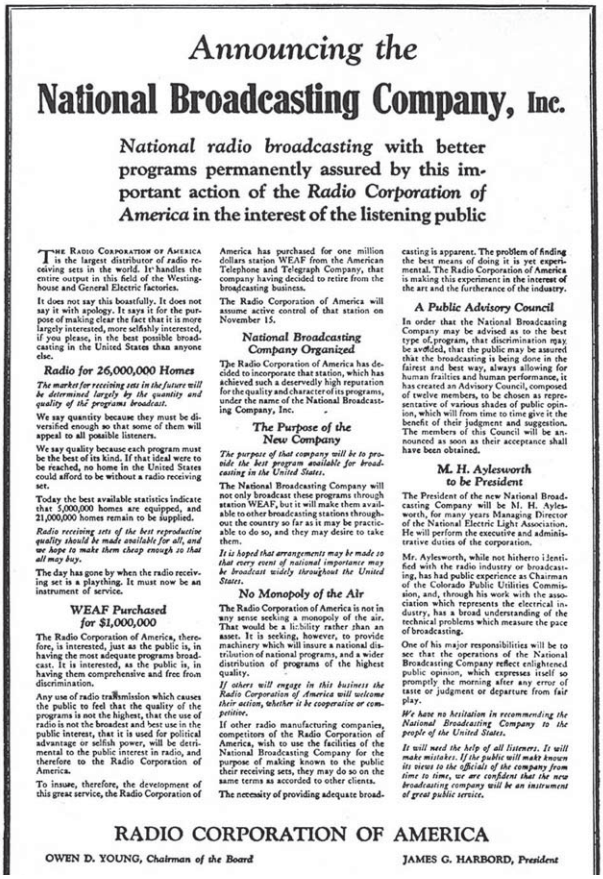
Nevertheless, AT&T began to refuse to supply lines to noncompliant stations – forcing those who needed hookups for networking or remote pickup to use inferior telegraph lines not designed for voice or music transmission. Programs fed through such connections were apt to be plagued with static, odd buzzes and very poor audio quality. Even stations that were perfectly willing to purchase Western Electric transmitters found themselves facing unexplained delays in delivery schedules if AT&T did not approve of their operations.

In one well-known case, when New York City desired to establish a municipal radio station, the Company successfully stonewalled all of its attempts to buy a new Western electric transmitter – also announcing that it would not supply telephone lines to such a station. AT&T felt that the city should buy time on WEAF to air its programs. But WNYC was finally established after the city managed to import a used Western Electric transmitter from Brazil.

AT&T now touched off a firestorm among the patent partners when it became clear that the Company also felt that it had the right to manufacture radio sets. Fierce legal battles, including an unsuccessful arbitration, began to take place between AT&T and the "radio members" of the patent pool. These issues were settled in 1926, with David Sarnoff of RCA assuming a key role in the negotiations. The patent pool agreements were now rewritten so that they more realistically dealt with the emerging field of radio broadcasting.

Among the key points in the agreement were that the radio stations of all patent pool members (including AT&T's WEAF) would be combined into a single broadcasting company owned jointly by RCA (50%), General Electric (30%) and Westinghouse (20%). The new organization would, most likely, begin selling air time along the lines pioneered by the telephone company. AT&T would leave the broadcast business, shutting down station WCAP. The Company would receive one million dollars in payment for WEAF's physical facilities (worth $200,000), the station's clear operating channel, and "goodwill."

AT&T would have limited rights (actually never used) to manufacture radio sets. But most importantly, they would be given the network interconnect business of the new broadcasting entity, providing the telephone lines needed for networking and remote pickups under a long-term contract. The Company could anticipate an income of about $800,000 for the first year of operation. This would go up considerably, of course, as the network was further expanded.



Announcing the

National Broadcasting Company, Inc.

National radio broadcasting with better programs permanently assured by this important action of the *Radio Corporation of America* in the interest of the listening public

THE RADIO CORPORATION OF AMERICA is the largest distributor of radio receiving sets in the world. It handles the entire output in this field of the Westinghouse and General Electric factories.

It does not say this boastfully. It does not say it with apology. It says it for the purpose of making clear the fact that it is more largely interested, more selfishly interested, if you please, in the best possible broadcasting in the United States than anyone else.

Radio for 26,000,000 Homes

The market for receiving sets in the future will be determined largely by the quantity and quality of the programs broadcast.

We say quantity because they must be diversified enough so that some of them will appeal to all possible listeners.

We say quality because each program must be the best of its kind. If that ideal were to be reached, no home in the United States could afford to be without a radio receiving set.

Today the best available statistics indicate that 5,000,000 homes are equipped, and 21,000,000 homes remain to be supplied.

Radio receiving sets of the best reproductive quality should be made available for all, and we hope to make them cheap enough so that all may buy.

The day has gone by when the radio receiving set is a plaything. It must now be an instrument of service.

WEAF Purchased for $1,000,000

The Radio Corporation of America, therefore, is interested, just as the public is, in having the most adequate programs broadcast. It is interested, as the public is, in having them comprehensive and free from discrimination.

Any use of radio transmission which causes the public to feel that the quality of the programs is not the highest, that the use of radio is not the broadest and best use in the public interest, that it is used for political advantage or selfish power, will be detrimental to the public interest in radio, and therefore to the Radio Corporation of America.

To insure, therefore, the development of this great service, the Radio Corporation of America has purchased for one million dollars station WEAF from the American Telephone and Telegraph Company, that company having decided to retire from the broadcasting business.

The Radio Corporation of America will assume active control of that station on November 15.

National Broadcasting Company Organized

The Radio Corporation of America has decided to incorporate that station, which has achieved such a deservedly high reputation for the quality and character of its programs, under the name of the National Broadcasting Company, Inc.

The Purpose of the New Company

The purpose of that company will be to provide the best program available for broadcasting in the United States.

The National Broadcasting Company will not only broadcast these programs through station WEAF, but it will make them available to other broadcasting stations throughout the country so far as it may be practicable to do so, and they may desire to take them.

It is hoped that arrangements may be made so that every event of national importance may be broadcast widely throughout the United States.

No Monopoly of the Air

The Radio Corporation of America is not in any sense seeking a monopoly of the air. That would be a liability rather than an asset. It is seeking, however, to provide machinery which will insure a national distribution of national programs, and a wider distribution of programs of the highest quality.

If others will engage in this business the Radio Corporation of America will welcome their action, whether it be cooperative or competitive.

If other radio manufacturing companies, competitors of the Radio Corporation of America, wish to use the facilities of the National Broadcasting Company for the purpose of making known to the public their receiving sets, they may do so on the same terms as accorded to other clients.

The necessity of providing adequate broadcasting is apparent. The problem of finding the best means of doing it is yet experimental. The Radio Corporation of America is making this experiment in the interest of the art and the furtherance of the industry.

A Public Advisory Council

In order that the National Broadcasting Company may be advised as to the best type of program, that discrimination may be avoided, that the public may be assured that the broadcasting is being done in the fairest and best way, always allowing for human frailties and human performance, it has created an Advisory Council, composed of twelve members, to be chosen as representative of various shades of public opinion, which will from time to time give it the benefit of their judgment and suggestion. The members of this Council will be announced as soon as their acceptance shall have been obtained.

M. H. Aylesworth to be President

The President of the new National Broadcasting Company will be M. H. Aylesworth, for many years Managing Director of the National Electric Light Association. He will perform the executive and administrative duties of the corporation.

Mr. Aylesworth, while not hitherto identified with the radio industry or broadcasting, has had public experience as Chairman of the Colorado Public Utilities Commission, and, through his work with the association which represents the electrical industry, has a broad understanding of the technical problems which measure the pace of broadcasting.

One of his major responsibilities will be to see that the operations of the National Broadcasting Company reflect enlightened public opinion, which expresses itself so promptly the morning after any error of taste or judgment or departure from fair play.

We have no hesitation in recommending the National Broadcasting Company to the people of the United States.

It will need the help of all listeners. It will make mistakes. If the public will make known its views to the officials of the company from time to time, we are confident that the new broadcasting company will be an instrument of great public service.

RADIO CORPORATION OF AMERICA

OWEN D. YOUNG, *Chairman of the Board* JAMES G. HARBORD, *President*

RCA's 1926 announcement of the formation of The National Broadcasting Company.

NBC and its Two Networks

In September 1926, RCA announced the deal to the general public with full-page promotional advertising. The new entity, to be called "The National Broadcasting Company," would air its programs via a number of stations throughout the country, and would plan to broadcast nationwide during "every event of public importance." Only the finest programming would be produced and offered to the public. A "public advisory council" representing the "various shades of public opinion" would monitor content to make sure it was fair and non discriminatory. And (mindful of its vulnerability to government scrutiny for monopolistic practices), NBC would make its facilities available to competitors at fair pricing.

NBC made its debut on November 15, 1926, in a breathtaking four-hour broadcast from the Waldorf-Astoria ballroom in New York City. The program included live and remote performances by stars of stage and screen, the New York Symphony, and famous dance bands at various locations. This glittering show had a "studio audience" of about 1,000 VIPs and a radio audience estimated at 12 million.

Before the end of the year, NBC had organized its radio stations into two separate networks: the "Red Network," with programs originating at WEAF and the "Blue Network," with programs originating at WJZ. The story goes that the networks got their names from the colors used by AT&T and NBC engineers to sketch out the telephone circuit pathways for interconnecting the two radio groups. These networks grew rapidly, and the programs broadcast over them grew in quality and variety.

Because of the deep pockets of its owners, NBC had the money to do things right. New studios, not merely state-of-the-art but "cutting edge," were built at a Fifth Avenue, New York City location. Constructed on springs to dampen noise pick up, they incorporated newly designed equipment for the creative control and recording of sound. And the dramatic, musical and news programs we associate with the "golden age of radio" began to be produced and aired.

CBS is Born

The first stirrings of what was to become a competitive network were begun in 1927 by a well-respected artist's manager named Arthur Judson and his associate, promoter George A. Coats. They had formed a company to develop radio programs based on the word of David Sarnoff, who had led Judson to believe that he would become a supplier of programs and artists for NBC. When this did not come to pass, Judson decided to explore the formation of his own radio network.

Judson linked up with some highly-motivated partners and formed "The United Independent Broadcasters." By offering quality programs and generous financial terms, they quickly signed up a dozen stations, including New York's WOR – which was to become the network origination point. When AT&T began to drag its feet regarding the supplying of telephone lines, associate Coates went to Washington – where important radio legislation containing strong antimonopolistic language (The Radio Act of 1927) was being crafted. Suddenly AT&T decided to play ball.

But the Judson group really didn't want to run a network. They wanted to become a supplier of artists and programs as originally planned. Eventually they interested the Columbia Phonograph Company into taking over network operations and supplying necessary cash. Columbia's business was in a slump because of competition from broadcasting and its rival, Victor Records, was being purchased by NBC. So Columbia was motivated to follow suit in establishing a similar connection. "The United Independent Broadcasters" now became "The Columbia Phonograph Broadcasting Company."

Overcoming difficult technical problems (WOR's new studio and control room facilities were only partly completed), the new broadcasters debuted their network with some very ambitious concert and operatic programs. But they were still a hand-to-mouth organization and were only able to pay salaries and line charges through "nick of time" investments by backer/friends. Soon Columbia records pulled out.

But another nick-of time rescue was arranged through the owners of WCAU in Philadelphia, which was the network's original affiliate. A new investment group was put together and the organization was renamed "The Columbia Broadcasting System." When financial problems continued to mount alarmingly, the investors looked for a person to go to New York and assume the presidency of the network.

This turned out to be William S. Paley, an ambitious young man who was an executive in a cigar company owned by his family. An early network sponsor, Paley's company had enjoyed spectacular results from its advertising and become convinced of the power of radio. The rest is history. After taking command of the network in 1928, Paley built CBS into the formidable organization it is today – remaining associated with it until his death in 1990.

Let the wonderful Radiola 16 take you to the great National Conventions

YOU can sit in your living room, with a Radiola 16, and hear every word from the platforms and the floors of the big political conventions at Houston and Kansas City.

You will hear the nominating speeches and the cheers and uproar that will greet the names of the "favorite sons." You will hear the balloting by states, from Alabama to the Philippines. You will know the names of the successful candidates at the same instant they are announced in the convention halls.

Every day of the year a Radiola 16 keeps you in touch with the world.

RCA LOUDSPEAKER 100A. The leader in its class. Ideal to use with Radiola 16. You can tell it by its rich, mellow tone. $35

RCA RADIOLA 16. 6-tube, tuned radio frequency receiver. A big performer for a little price. Can be operated with storage batteries; or, by the addition of socket-power devices, with A. C. electric current. Equipped with Radiotrons. $92.75

RCA HOUR every Saturday night through these stations associated with National Broadcasting Company:

8 to 9 p.m. Eastern Time	8 to 9 p.m. Pacific Time	7 to 8 p.m. Central Time
WJZ WBAL WHEI WJC WTIC WHAM WTAR KDKA WTAG WLW WCSH WJR	KFI KHQ KGW KFOA KOMO	KYW WDAF KSD WOW WCCO WHAS WHO WSM WSB WRC

It brings the news of great events; crop, weather and market reports; the voices of famous singers and the music of great orchestras; opera and drama direct from the metropolitan stages—programs for which millions of dollars a year are spent.

Radiola 16 is one of the latest receiving sets developed in the research laboratories of General Electric, Westinghouse and the Radio Corporation of America. There are other Radiolas ranging up to $895, but none that gives more per dollar than the compact Radiola 16.

Buy with confidence where you see this sign.

RADIO CORPORATION OF AMERICA

RCA Radiola

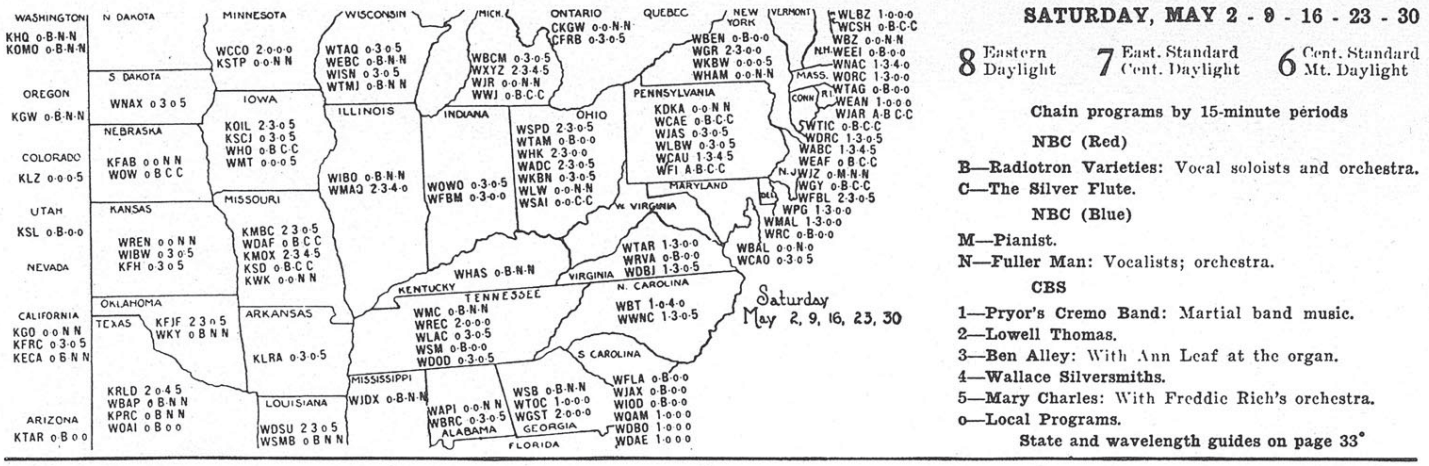
MADE BY THE MAKERS OF THE RADIOTRON

NEW YORK - CHICAGO SAN FRANCISCO

Mid 1920s RCA ad illustrates how manufacturers used broadcasting activities to sell radio sets.

Mutual Broadcasting System

An interesting variant of network operation was initiated in 1934, when


SATURDAY, MAY 2 - 9 - 16 - 23 - 30
8 Eastern Daylight
7 East. Standard Cent. Daylight
6 Cent. Standard Mt. Daylight
Chain programs by 15-minute periods
NBC (Red)
B—Radiotron Varieties: Vocal soloists and orchestra.
C—The Silver Flute.
NBC (Blue)
M—Pianist.
N—Fuller Man: Vocalists; orchestra.
CBS
1—Pryor's Cremo Band: Martial band music.
2—Lowell Thomas.
3—Ben Alley: With Ann Leaf at the organ.
4—Wallace Silversmiths.
5—Mary Charles: With Freddie Rich's orchestra.
o—Local Programs.
State and wavelength guides on page 33
Saturday
May 2, 9, 16, 23, 30

Detail from a 1931 radio publication shows NBC Red, NBC Blue and CBS Saturday broadcasts for the month of May.

four major stations: WGN (Chicago), WOR (Newark NJ), WLW (Cincinnati), and WXYZ (Detroit) linked themselves to broadcast as "The Mutual Broadcasting System." Instead of being controlled and programmed by a central ownership, the stations operated as equals, sharing programs and management. Eventually this network grew to include more affiliates than any of the others – including 950 stations by 1979.

Plagued by poor management practices that included stock manipulation and other shady issues, Mutual began losing affiliates in the mid 1950s and suffered a gradual decline. It has not offered programming since 1999.

The Creation of ABC

NBC and CBS continued to grow and prosper throughout the Depression years. At the start of World War II, the NBC networks were operating 225 stations, or over 25% of the stations in the country.

CBS had overcome its shaky beginnings and had grown to 118 stations, or over 14% of U.S. radio stations. Mutual then had 160 stations, or 20% of the total.

The last of our major national broadcasters came into being when NBC was forced to sell one of its networks. This was the result of a hard-fought 1941 FCC anti-monopoly ruling upheld by the supreme court in 1943. That same year NBC's less-important Blue Network was sold for $8 million to station WMCA (New York), owned by "Life Savers" candy manufacturer Edward J. Noble. This network became "The American Broadcasting Company" in 1945.

Soon after the divestiture, as more buying and selling of stations took place, the radio affiliate scorecard read: NBC 142, CBS 116, ABC 143, Mutual 219. By 1947, just before the major impact of television and, to a lesser extent, FM, network radio operations were at their peak. Of the more than 1000 AM radio stations broadcasting at the time, 97 percent were affiliated with one or more networks. By 1950, as a result of postwar business expansion, the number of AM stations had doubled. But only 56 percent of them were affiliated with a network.

Of course the golden age of radio network broadcasting has long passed, but the NBC, CBS and ABC television networks owe much to the planning and creative thinking that began with the "radio craze" of the 1920s.

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W.C. Fields carries on during a 1938 "Hit Parade" program. CBS press release photo.